



**Hewlett Packard
Enterprise**

HPE StoreEver LTO-8 Ultrium Tape Drives

Technical Reference Manual Volume 4 Specifications Guide

Abstract

This is one of five volumes that document Hewlett Packard Enterprise LTO Ultrium 8 tape drives (Fibre Channel and SAS). This volume details specifications. See the appendix at the end of this guide for details on the other guides.

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Features

Feature	Specification
Recording format	Linear Serpentine Ultrium-8 and Ultrium-7.
Data compression	ALDC
Data encoding method	32-channel 32/33 RLL NPML
Variable speed recording	100–300 MB/s Ultrium-8 ¹
Read-While-Write	Standard—data is verified immediately after it is written
Auxiliary memory in cartridge (CM)	Standard 16K LTO-CM as part of Ultrium format
Data interfaces	FC: 8 Gb/s dual port Fibre Channel
	SAS: 6 Gb/s dual port SAS
Library interface (ACI/ADI)	Bi-directional RS422(serial protocol RS422 9600 to 153600 baud)
Management Interface (iADT)	Ethernet (10Base-T and 100 Base-TX)
Main data buffer size	1 GB (1073741824 bytes)

¹ Decimal MB/s including wrap turn-around and up to 1% dataset re-writes.

Data security features

Description	Specification
Data encryption algorithm	AES256-GCM
Data encryption format	Supported as per U-832 for LTO-8, U-732 for LTO-7 media.
Certification level	Designed for FIPS140–2 certification level 1

Tape partitioning features

Description	Specification
Number of partitions	Up to 4 (LTO-8, LTO-7 media)
WORM cartridge	Partitioning a WORM cartridge is not supported as per U-832 Annex L

Physical specification

Dimensions

		Half-height
Internal	width:	146 ± 0.25 mm
	height:	41 ± 0.25 mm
	depth:	223.00 ± 0.25 mm (FC) 205.00 ± 0.25 mm (SAS)
External (SAS only)	width:	224 mm
	height:	79 mm
	depth:	301 mm

Half-height drives

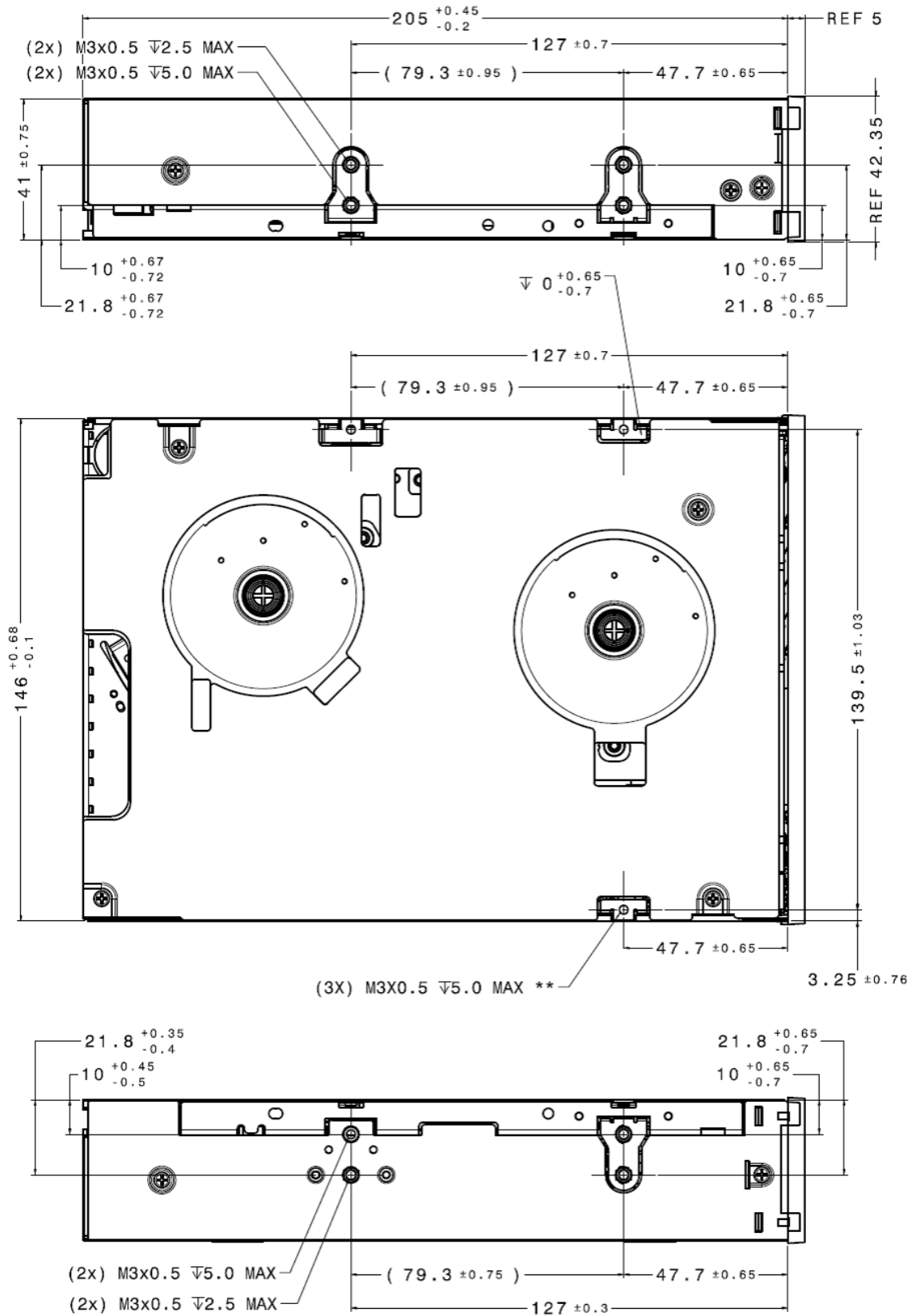


Figure 1: Half-height drives—SAS

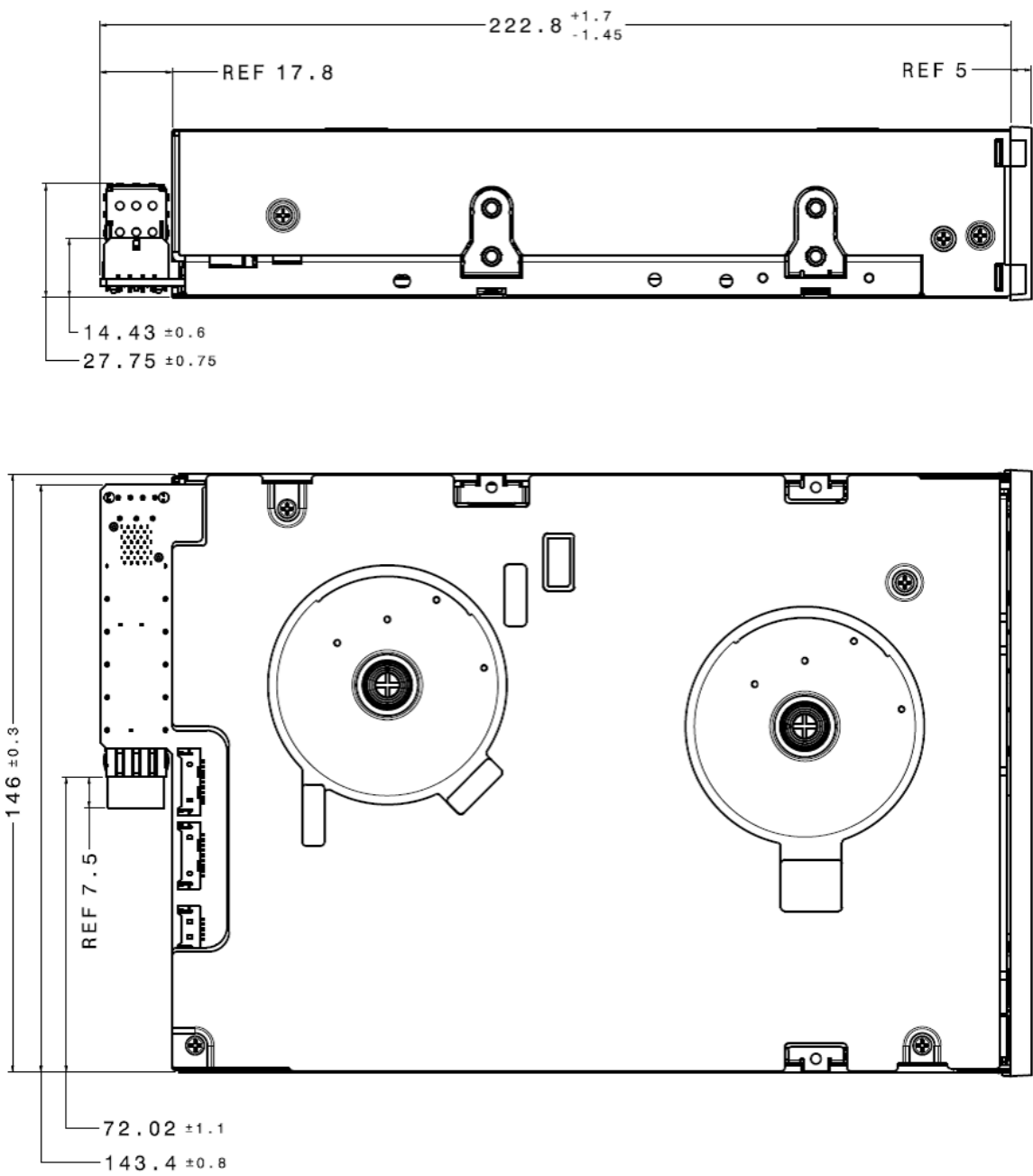


Figure 2: Half-height drives—Fibre Channel

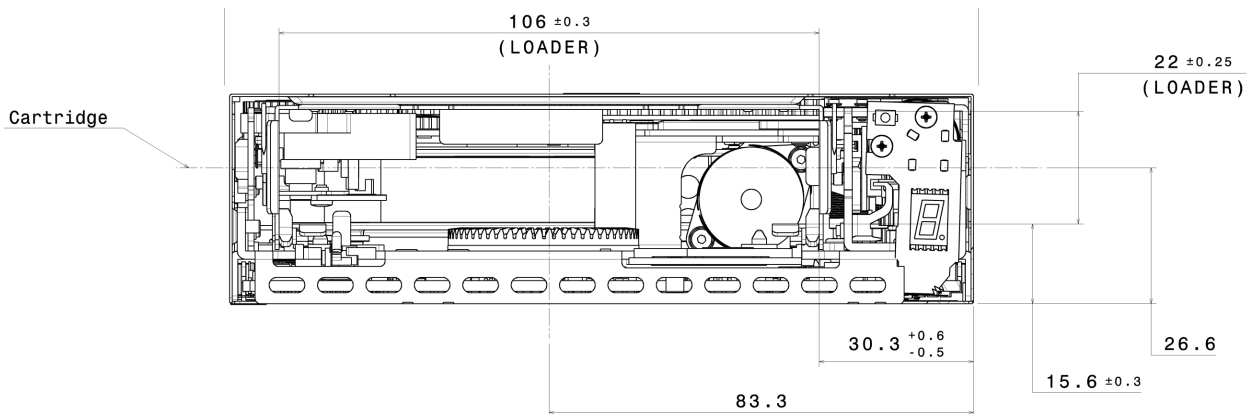
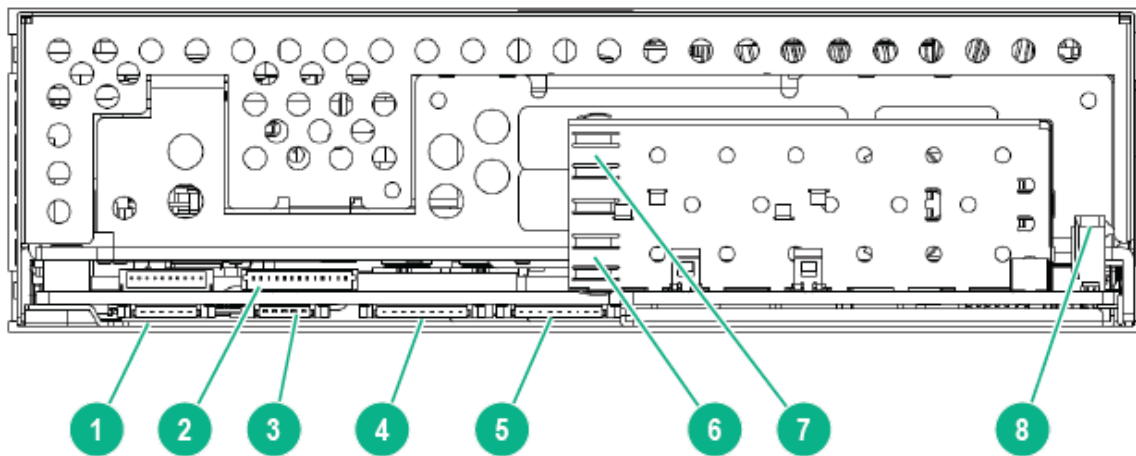
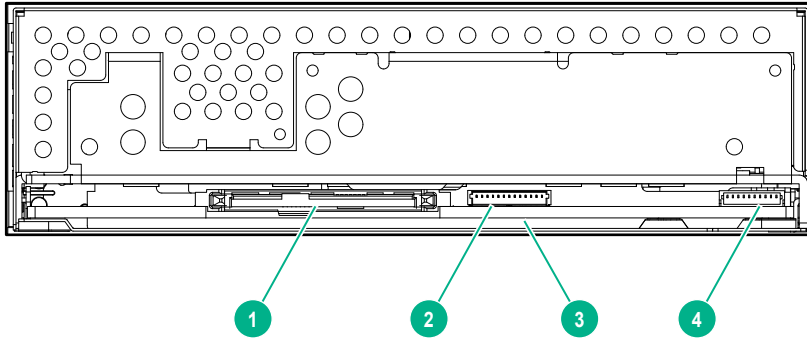


Figure 3: Half-height automation drives—front



1. Library Interface (ADI)	2. Ethernet Connector
3. LED controls	4. AL_PL/LID/Status Connector (J39)
5. Speed/Topology Connector (J40)	6. Fibre Channel Transceiver (Port 0)
7. Fibre Channel Transceiver (Port 1)	8. Power Connector

Figure 4: Half-height drives—rear view (Fibre Channel)



1. SAS Connectors	2. Ethernet Connector
3. LED controls	4. Library Interface (ADI) and Serial Port (for service use only)

Figure 5: Half-height drives—rear view (SAS)

Product weight

	Half-height
Internal ¹	1.7 kg (typical)
External	4.0 kg (typical)

¹ Including front panel and ESD bag, but excluding rails.

Drive orientation

Hewlett Packard Enterprise LTO Ultrium drives will operate in 0°, -90° and +90° orientations when viewed from the front panel. In addition, in the 0° axis, the drive will operate with +20° nose-up tilt.

Electrical requirements

DC voltage specifications

	5V	12V
Maximum voltage	5.25V	13.2V
Minimum voltage	4.75V	10.8V
Typical current	4.0A (HH)	1.0A (HH)
Maximum current (Steady State)	<4.0A (HH)	<1.1A (HH)
Peak instantaneous current	4.5A <1ms (HH)	4.0A <1ms (HH)

Currents drawn from the power supplies

Half-height Fibre Channel and SAS drives

	FC or SAS drive	
Normal Supply	5 V DC	12 V DC
Idle Mode (No cartridge)		
Typical current	3.5 A	0.15 A
Typical power	17.50 W	1.8 W
Idle Mode (With cartridge)		
Typical current	3.5 A	0.30 A
Typical power	17.50 W	3.6 W
Loading/Unloading Cartridge		
Maximum current	4.0 A < 1ms	3 A < 1ms
Maximum power	20 W < 1ms	36 W < 1ms
Reading and Writing		
Typical current	4.0 A	0.8 A

Table Continued

	FC or SAS drive	
Normal Supply	5 V DC	12 V DC
Maximum current	4.5 A < 1ms	4.0 A < 1ms
Typical power	20 W	12 W
Maximum power	22.5 W < 1ms	42 W < 1ms
Locate/Rewind		
Maximum current	4.0 A < 1ms	3.5 A < 1ms
Maximum power	20 W < 1ms	48 W < 1ms
Power down Mode (No cartridge)		
Typical current	2.0 A	0.0 A
Typical power	10 W	0.0 W
Power down mode (With cartridge)		
Typical current	3.0 A	0.3 A
Typical power	15 W	3.6W

NOTE:

Hewlett Packard Enterprise Ultrium SAS tape drives are powered via the SAS connector and do not have a regular 4-pin power connector.

Power consumption specifications

Half-height drives

The following are the typical power consumptions drawn from the power supplies for the Hewlett Packard Enterprise LTO Ultrium 8 half-height tape drive.

Power Measurements	FC, SAS drive
Idle Mode (No cartridge)	11W
Idle Mode (Cartridge loaded)	13W
Reading and Writing	30W

Electromagnetic compatibility

NOTE:

The EMC performance of internal storage products depends on the characteristics of the system in which the product is installed. Hewlett Packard Enterprise has tested products installed in server enclosures and in external desktop enclosures to verify EMC performance against the regulatory standards in force at the time of introduction.

Products will comply with new regulatory standards by or before the date of withdrawal of the superseded standards, during their production life.

EMC test specification

The following are the specifications for an internal drive configuration.

General standard	Reference standards	Test description	Test level/class
EN 55022:2010	CISPR 22:2008	Radiated Emissions	Class A
VCCI (V-3/2014.04)	CISPR 22:2005 In A2:2006	Radiated Emissions	Class A
FCC CFR 47 Part 15	ANSI C63.4:2003	Radiated Emissions	Class A Up to 31.0GHz
EN 55024:2010	EN/IEC 61000-4-2	Electrostatic Discharge	8.8kV Air and 4.4kV Contact
	EN/IEC 61000-4-3	Radiated RF Interference	4.5V/m, 80% AM, 80-1000MHz

The following are the specifications for an external drive configuration.

General standard	Reference standards	Test description	Test level/class
FCC CFR 47 Part 15	ANSI C63.4:2003	Radiated Emissions	Class A Up to 31.0GHz
VCCI (V-3/2014.04)	CISPR 22:2005 In A2:2006	Emissions	Class A
EN 55022:2010	CISPR 22:2008	Emissions	Class A
EN/IEC 61000-3-3	IEC 61000-3-3	Flicker	dmax=4%
EN/IEC 61000-3-2	IEC 61000-3-2	Harmonics	Class A
EN 55024:1998+A1 CISPR 24:1997+A1 EN 300 386:2001 + Extended Additional Requirements	EN/IEC 61000-4-2	Electrostatic discharge	8.8kV Air and 4.4kV Contact
	EN/IEC 61000-4-3	Radiated RF interference	4.5V/m, 80% AM, 80-1000MHz

Table Continued

General standard	Reference standards	Test description	Test level/class
	EN/IEC 61000-4-4	Fast transients bursts	1.1kV AC power port
	EN/IEC 61000-4-4	Fast transients bursts	0.55kV signal port
	EN/IEC 61000-4-5	Lightning surge	2.2kV L-E and 1.1kV L-L
	EN/IEC 61000-4-6	Conducted RF field	3.8V (all ports)
	EN/IEC 61000-4-11	Voltage dip	100% x ½ cycle
	EN/IEC 61000-4-11	Voltage dip	30% 0.5 & 1s / 50Hz and 30% 0.5 & 1s / 60Hz
	EN/IEC 61000-4-11	Voltage dip	100% x 250 cycles / 50Hz and 100% x 300 cycles / 60Hz

ITE emissions

Parameter	Standards	
	International	European Economic Area
Radiated and conducted ¹	CISPR 22 FCC CFR 47 Part 15, referencing ANSI C63.4-2003 (U.S.A. only)	EN 55022:2010
Harmonic current ¹	IEC 61000-3-2:2005 + Amendment 1:2008 + Amendment 2:2009	EN 61000-3-2:2006 + A1:2009 + A2:2009
Voltage fluctuations and flicker ¹	IEC 61000-3-3:2013	EN 61000-3-3:2013

¹ The marked standard applies to external (desktop) products only

ITE immunities

Parameter	Standards	
	International	European Economic Area
Generally	CISPR 24:2010 referencing the following:	EN 55024:2010 referencing the following:
Electrostatic discharge	IEC 61000-4-2:2008	EN 61000-4-2:2009

Table Continued

Parameter	Standards	
	International	European Economic Area
Radiated RF electromagnetic field	IEC 61000-4-3:2006 inc A1:2007 and A2:2010	EN 61000-4-3:2006 inc A1:2008 and A2:2010
Electrical fast transient/Burst ¹	IEC 61000-4-4:2004	EN 61000-4-4:2004
Surge ¹	IEC 61000-4-5:2005	EN 61000-4-5:2006
Conducted disturbances by RF fields ¹	IEC 61000-4-6:2008	EN 61000-4-6:2009
Voltage dips, interruptions & variations ¹	IEC 61000-4-11:2004	EN 61000-4-11:2004

¹ The marked standard applies to external (desktop) products only

Environmental

Climatics

These apply to the mechanism unless otherwise noted. For the environmental specification of media, see **Environmental specifications (media)** on page 22.

Operating

Parameter	Specification
Operating temperature with media	10°C to 40°C (50°F to 104°F) @ 3 cfm
Maximum operating rate of temperature change	10°C/hr (50°F/hr)
Operating non-condensing humidity	20% to 80% RH
Maximum operating humidity rise	<30%/hr
Maximum wet bulb temperature	26°C (79°F)
Operating altitude	0 to 4 km (0 to 13,000 ft)

Non-operating

Parameter	Specification
Non-operating temperature	-40°C to 60°C (-40°F to 140°F)
Maximum non-operating temperature rise	20°C/hr (68°F/hr)
Non-operating humidity	10% to 90% RH (non-condensing)
Non-operating humidity rise	30%/hr
Non-operating altitude	0 to 15.25 km (0 to 50,000 ft)

General

Parameter	Specification
Suspended particle density	<200 µg/m ³

Dynamics

Description	Mode	Specification
Vibration (Brick)	Operating	Random (3 axes): Half Height: 0.10 G rms 5 to 500 Hz Swept Sine (vertical axis): 0.20 G peak 3 to 200 Hz @ 0.5 octave/min
	Non-Operating (3 axes)	Random: 7 to 20 Hz 3.00E-3 g ² /Hz, 20 to 312 Hz 2.75E-3 g ² /Hz, 312 to 400 Hz 1.30E-4 g ² /Hz, 400 to 800 Hz 8.00E-5 g ² /Hz
Shock (Brick—all six faces)	Operating	Half Height: 10G peak 3 msec half-sine
	Non-Operating	100G peak 10 ms (half-sine)
Transportation (Vibration—single pack)	Vibration(3 axes)	Swept sine: 0.5G peak 5–200–5 Hz @ 1 octave/min 5 min dwell at peak resonance Random: approx. 1.47G rms (30 min/axis) 5–100 Hz 0.015 g ² /Hz 100–200 Hz @ -6dB/octave 200 Hz 0.0038 g ² /H Drop height = 0.91m (36 in) 10 vertical impacts (6 faces and 4 bottom corners)
Transportation (Palletized—normal shipping axes only)	Vibration	Swept sine: 0.5 G peak 5–200–5 Hz @ 1 octave/min 5 min dwell at peak resonance Random: approx. 1.47G rms (30 min/axis) 5–100 Hz 0.015 g ² /Hz 100–200 Hz @ -6dB/octave 200 Hz 0.0038 g ² /H
	Shock	Drop height = 0.30m (12 in) 5 impacts (1 vertical flat base, 4 rotational edges)

Noise

Parameter	Specification
Operating acoustic noise	<5.8 bel sound power

Airflow

Hewlett Packard Enterprise LTO Ultrium drives require forced airflow from front to back.

	Half-height drives
Airflow	3 CFM
Pressure drop required	0.03 inches H ₂ O

Safety

Safety and EMC agency requirements

Safety tested to:

- IEC 60950-1:2005 (Second Edition) + Am 1:2009 + Am 2:2013
- EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013
- CAN/CSA-C22.2 No. 60950-1-07, Amendment 2:2014 (MOD) - Information Technology Equipment – Safety – Part 1: General Requirements
- ANSI/UL 60950-1-2014, 2nd Edition - Information Technology Equipment – Safety – Part 1: General Requirements

Country	Agency	Scope	Config	FC	SAS	Notes
USA	UL or CSA	Safety	Internal	Y	Y	
			External	N/A	Y	
	FCC	EMC	—	Y	Y	Refer to DoC
Canada	CSA or UL	Safety	—	Y	Y	Refer to UL
	ICES	EMC	—	Y	Y	Refer to DoC
Europe	CE	Safety-EMC	Internal	Y	Y	DoC
			External	N/A	Y	DoC
Germany	UL-EU or NEMKO	Safety	Internal	Y	Y	Refer to UL
			External	N/A	Y	Refer to UL
Russia	EAC	Safety-EMC	External	N/A	Y	
South Africa	SABS	Safety-EMC	External	N/A	Y	
Taiwan	BSMI	Safety-EMC	Internal	Y	Y	
			External	N/A	Y	
Korea	KCC	EMC	Internal	Y	Y	
			External	N/A	Y	
Australia New Zealand	C-Tick	Safety-EMC	Internal	Y	Y	

Table Continued

Country	Agency	Scope	Config	FC	SAS	Notes
			External	N/A	Y	
Japan	VCCI	EMC	External	N/A	Y	
India	BIS	Safety	External	N/A	Y	

Transceivers

The Fibre Optic transceivers used in FC products are Class 1 Laser components and comply with US FDA regulations.

These components are certified to meet the Class 1 eye safety requirements of EN (IEC) 60825 and the electrical safety requirements of EN (IEC) 60950.

Media

Specification

HPE Product Number	Format	Capacity ¹	Notes
Q2078A	Ultrium-8	30000GB	Read and write
Q2078W	Ultrium-8 WORM	30000GB	Write once, read many times
C7977A	Ultrium-7	15000GB	Read and write
C7977W	Ultrium-7 WORM	15000GB	Write once, read many times

¹ Capacities at 2.5:1 data compression for LTO-7 and LTO-8. The actual capacity depends on the compressibility of the data.

NOTE:

The Hewlett Packard Enterprise Ultrium LTO-8 tape drives do not support Ultrium-6, Ultrium-5, Ultrium-4, Ultrium-3, Ultrium-2, and Ultrium-1 cartridges. Hewlett Packard Enterprise recommends the use of the "set capacity" SCSI command to logically shorten standard cartridges for test purposes.

		Ultrium-8	Ultrium-7 Type M ¹	Ultrium-7
Media	Media capacities (native) ²	12.0 TB	9.0 TB	6.0 TB
Media type (base film):		Barium Ferrite (Poly-Ethylene-Napthalate) or equivalent	Barium Ferrite (Poly-Ethylene-Napthalate) or equivalent	Barium Ferrite (Poly-Ethylene-Napthalate) or equivalent
Total tape length (±1.0 m):		960 m	960 m	960 m
Tape length used for data:		922 m	922 m	922 m
Tape width:		12.65 mm	12.65 mm	12.65 mm
Tape thickness:		5.6 +0.2/-0.3 µm	5.6 +0.2/-0.3 µm	5.6 +0.2/-0.3 µm
Tape dimensional stability:		Total < 750 ppm Env. < 500 ppm Tension < 200 ppm Aging < 150 ppm	Total < 750 ppm Env. < 500 ppm Tension < 200 ppm Aging < 150 ppm	Total < 750 ppm Env. < 500 ppm Tension < 200 ppm Aging < 150 ppm
Rewind speed:		9 m/s for Half-height drives		
Cartridge	Weight:	0.220 kg		

Table Continued

		Ultrium-8	Ultrium-7 Type M ¹	Ultrium-7
Width:		105.4±0.30 mm		
Height:		21.5±0.25 mm		
Depth:		102.0±0.30 mm		
Cartridge memory capacity		16,352 bytes	16,352 bytes	16,352 bytes
Recording layout	Track pitch:	1.56 µm	1.95 µm	2.88 µm
Track density (TPI):		16280	13087	8826
Data tracks:		6656	5376	3584
Number of wraps:		208	168	112
Number of data bands:		4	4	4
RLL recording bit density: ³		20.668 Kb/mm	19.104 Kb/mm	19.104 Kb/mm

¹ LTO-7 Type M requires unused LTO-7 media which is initialized to allow data to be written at a higher track density.

² Decimal MB

³ RLL recording bit density

Environmental specifications (media)

Operating

Parameter	Specification
Ambient Temperature	10°C to 45°C (50°F to 113°F)
Relative Humidity (non-condensing)	10%* to 80%
Maximum Wet Bulb Temperature	26°C (78.8°F)

* The media is specified to operate down to 10% RH as a margin beyond the minimum specified for the operating drive (20%).

Storage (day-to-day)

Parameter	Specification
Ambient Temperature	16°C to 32°C (60°F to 90°F)
Relative Humidity (non-condensing)	20% to 80%

Table Continued

Parameter	Specification
Maximum Wet Bulb Temperature	26°C (78.8°F)
Media archive life	30 years

Storage (transportation)

Parameter	Specification
Ambient Temperature	-23°C to 49°C (-9.4°F to 102°F)
Relative Humidity (non-condensing)	5% to 80%
Maximum Wet Bulb Temperature	26°C (78.8°F)

Storage (archival)

Archival storage is recommended for cartridges must be stored for more than six months. Store cartridges in plastic containers, preferably on their sides.

Parameter	Specification
Ambient Temperature	5°C to 23°C (41°F to 73°F)
Relative Humidity (non-condensing)	20% to 50%
Maximum Wet Bulb Temperature	26°C (78.8°F)
Archive Life	30 years

LTO-Cartridge Memory (EEPROM)

LTO Cartridge Memory (LTO-CM) is EEPROM that is embedded in every LTO Ultrium tape cartridge. It is non-volatile and is contactless in that it is read by RF coupling rather than electrical contact.

Interface specification

- Contactless, passive RF interface using a proximity inductive coupling with a range in the order of millimeters.
- Power to the transponder is coupled through the interface.
- The range depends on implementation (maximum 10 mm to 20 mm). The best error rate performance occurs at short distances.
- The memory can be read from below (by a drive) or the front (in libraries).
- LTO-8 and LTO-7: 16,352 bytes
- >500K write cycles, 20-year data retention life
- Write/read size is worldwide (2 bytes) or block-wide (32 bytes)

Further information

For suggestions of how to make use of cartridge memory in libraries, see “LTO Cartridge Memory (LTO-CM)” in Chapter 5, “Supporting LTO Ultrium Features” in the *Software Integration Guide*, Volume 2 of the Hewlett Packard Enterprise LTO Ultrium Technical Manual.

LTO Ultrium format standard

Compatibility

Hewlett Packard Enterprise LTO Ultrium 8 drives are specified to interchange data cartridges with other tape drives that comply to the LTO U-732 and U-832 specification documents:

Capacity	Format	Write	Read
30,000 GB (write/read) at 2.5:1 compression	LTO Ultrium-8	Yes	Yes
30,000 GB WORM at 2.5:1 compression	LTO Ultrium-8	Yes	Yes
22,500 GB (write/read) at 2.5:1 compression	LTO Ultrium-7 Type M	Yes	Yes
15,000 GB (write/read) at 2.5:1 compression	LTO Ultrium-7	Yes	Yes
15,000 GB WORM at 2.5:1 compression	LTO Ultrium-7	Yes	Yes
6,250 GB (write/read) at 2.5:1 compression	LTO Ultrium-6	No	No
6,250 GB WORM at 2.5:1 compression	LTO Ultrium-6	No	No
3,000 GB (write/read) at 2:1 compression	LTO Ultrium-5	No	No
3,000 GB WORM (write/read) at 2:1 compression	LTO Ultrium-5	No	No
1,600 GB WORM (write/read) at 2:1 compression	LTO Ultrium-4	No	No
1,600 GB (write/read) (write/read) at 2:1 compression	LTO Ultrium-4	No	No
800 GB WORM (write/read) at 2:1 compression	LTO Ultrium-3	No	No
800 GB (write/read) (write/read) at 2:1 compression	LTO Ultrium-3	No	No
400 GB (write/read) (write/read) at 2:1 compression	LTO Ultrium-2	No	No
200 GB (write/read) (write/read) at 2:1 compression	LTO Ultrium-1	No	No
100 GB (write/read) (write/read) at 2:1 compression	LTO Ultrium-1	No	No

This specification only applies when:

- Cartridges carry the LTO Ultrium logo.
- Cartridges are not damaged or faulty.

- Cartridges are read on a drive in good operating condition, and have been written on a logo-certified drive in good condition.
- Environmental conditions (including DC voltage supplies) are within the specified limits.

Reliability

Description	Specification
MTBF (100% duty cycle)	250,000 hours
Load/unload life (only valid when the drive is operated in a standard office environment)	Half-height: 80,000 cycles
Population MSBF	100,000 cycles
Head life (typical)	60,000 hours
Reposition life	1,000,000 cycles (media limited)
Lifetime of drive (5 years at 100% duty cycle)	43,800 hours
Maximum cartridge uses	20,000 threads
Cartridge Extraction Force	2.25N to 5.8N (0.5 lbf to 1.3 lbf)
Backup failure rate	<0.1%
Restore failure rate	<0.001%
Interchange failure rate	<0.1%
Uncorrectable error rate	1 in 10 ¹⁹ bits
Undetected error rate	1 in 10 ²⁷ bits

Performance specification

The drive will match the throughput of any host up to the maximum supported transfer rate using the Data Rate Matching (DRM) functionality. There is no performance penalty for hosts that are slower than the maximum supported transfer rate. This capability is accomplished using buffer management for transfer rates of 0 MB/s up to the minimum tape streaming transfer rate, and the Adaptive Tape Speed (ATS) technology from the minimum to maximum tape streaming transfer rate.

Transfer rates

Maximum sustained transfer rate	Native:	300 MB/s
	Any compression:	700 MB/s
Streaming native data rate range		100–300 MB/s (LTO-8) 100–300 MB/s (LTO-7)
Burst transfer rate	FC:	800 MB/s
	SAS:	600 MB/s
Maximum block size	without encryption:	16 MB
	with encryption:	8 MB

Data compression

The compression engine uses an enhanced algorithm based on ALDC where data expansion due to redundant data is minimized. This is achieved by having two compression schemes (normal and pass-through) with the ability to switch dynamically between them.

It is possible to force the drive to turn off Data Compression using the Data Compression mode page or the Select Data Compression Algorithm parameter in the Device Configuration Mode Page.

Speeds

Tape read/write speed	4.6 m/s (LTO-8)
	5.1 m/s (LTO-7)
Tape rewind speed	9 m/s for Half-height drives

Timings

Capacity full backup times

The following table shows approximate backup times for supported tape cartridges:

Cartridge	Time
30000 GB LTO-8	11.5 hours
15000 GB LTO-7	5.56 hours

Load/unload times

	LTO-8 HH	LTO-7 FH	LTO-7 HH
Typical load time to BOT, ready to write from start of load	15s	15s	15s
Typical unload time, excluding rewind	20s	20s	20s
Automation eject (after the tape is unthreaded)	<1s	<1s	<1s

Locate times (time to data)

		Time
Average locate time (BOT - MOT)	30000 GB LTO-8:	60s
	15000 GB LTO-7:	46s

Other times

Parameter	Time
Mean reposition time	5.2s
Average rewind time (MOT - BOT)	Ultrium-8: 62s Ultrium-7: 46s
Cleaning time with a cleaning cartridge	58–152s

Support and other resources

Accessing Hewlett Packard Enterprise Support

- For live assistance, go to the Contact Hewlett Packard Enterprise Worldwide website:
<http://www.hpe.com/assistance>
- To access documentation and support services, go to the Hewlett Packard Enterprise Support Center website:
<http://www.hpe.com/support/hpesc>

Information to collect

- Technical support registration number (if applicable)
- Product name, model or version, and serial number
- Operating system name and version
- Firmware version
- Error messages
- Product-specific reports and logs
- Add-on products or components
- Third-party products or components

Accessing updates

- Some software products provide a mechanism for accessing software updates through the product interface. Review your product documentation to identify the recommended software update method.
- To download product updates:

Hewlett Packard Enterprise Support Center

www.hpe.com/support/hpesc

Hewlett Packard Enterprise Support Center: Software downloads

www.hpe.com/support/downloads

Software Depot

www.hpe.com/support/softwaredepot

- To subscribe to eNewsletters and alerts:
www.hpe.com/support/e-updates
- To view and update your entitlements, and to link your contracts and warranties with your profile, go to the Hewlett Packard Enterprise Support Center **More Information on Access to Support Materials** page:

! **IMPORTANT:**

Access to some updates might require product entitlement when accessed through the Hewlett Packard Enterprise Support Center. You must have an HPE Passport set up with relevant entitlements.

Customer self repair

Hewlett Packard Enterprise customer self repair (CSR) programs allow you to repair your product. If a CSR part needs to be replaced, it will be shipped directly to you so that you can install it at your convenience. Some parts do not qualify for CSR. Your Hewlett Packard Enterprise authorized service provider will determine whether a repair can be accomplished by CSR.

For more information about CSR, contact your local service provider or go to the CSR website:

<http://www.hpe.com/support/selfrepair>

Remote support

Remote support is available with supported devices as part of your warranty or contractual support agreement. It provides intelligent event diagnosis, and automatic, secure submission of hardware event notifications to Hewlett Packard Enterprise, which will initiate a fast and accurate resolution based on your product's service level. Hewlett Packard Enterprise strongly recommends that you register your device for remote support.

If your product includes additional remote support details, use search to locate that information.

Remote support and Proactive Care information

HPE Get Connected

www.hpe.com/services/getconnected

HPE Proactive Care services

www.hpe.com/services/proactivecare

HPE Proactive Care service: Supported products list

www.hpe.com/services/proactivecaresupportedproducts

HPE Proactive Care advanced service: Supported products list

www.hpe.com/services/proactivecareadvancedsupportedproducts

Proactive Care customer information

Proactive Care central

www.hpe.com/services/proactivecarecentral

Proactive Care service activation

www.hpe.com/services/proactivecarecentralgetstarted

Warranty information

To view the warranty for your product or to view the *Safety and Compliance Information for Server, Storage, Power, Networking, and Rack Products* reference document, go to the Enterprise Safety and Compliance website:

www.hpe.com/support/Safety-Compliance-EnterpriseProducts

Additional warranty information

HPE ProLiant and x86 Servers and Options

www.hpe.com/support/ProLiantServers-Warranties

HPE Enterprise Servers

www.hpe.com/support/EnterpriseServers-Warranties

HPE Storage Products

www.hpe.com/support/Storage-Warranties

HPE Networking Products

www.hpe.com/support/Networking-Warranties

Regulatory information

To view the regulatory information for your product, view the *Safety and Compliance Information for Server, Storage, Power, Networking, and Rack Products*, available at the Hewlett Packard Enterprise Support Center:

www.hpe.com/support/Safety-Compliance-EnterpriseProducts

Additional regulatory information

Hewlett Packard Enterprise is committed to providing our customers with information about the chemical substances in our products as needed to comply with legal requirements such as REACH (Regulation EC No 1907/2006 of the European Parliament and the Council). A chemical information report for this product can be found at:

www.hpe.com/info/reach

For Hewlett Packard Enterprise product environmental and safety information and compliance data, including RoHS and REACH, see:

www.hpe.com/info/ecodata

For Hewlett Packard Enterprise environmental information, including company programs, product recycling, and energy efficiency, see:

www.hpe.com/info/environment

Documentation feedback

Hewlett Packard Enterprise is committed to providing documentation that meets your needs. To help us improve the documentation, send any errors, suggestions, or comments to Documentation Feedback (docsfeedback@hpe.com). When submitting your feedback, include the document title, part number, edition, and publication date located on the front cover of the document. For online help content, include the product name, product version, help edition, and publication date located on the legal notices page.